



west virginia department of environmental protection

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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.: R13-2863A
Plant ID No.: 039-00044
Applicant: Cranberry Pipeline Corporation (CPC)
Facility Name: Staten Run Compressor Station
Location: Montgomery, Kanawha County
SIC Code: 1311
NAICS Code: 211111
Application Type: Modification
Received Date: May 14, 2013
Engineer Assigned: David Keatley
Fee Amount: \$1,000.00
Date Fee Received: May 16, 2013
Complete Date: September 19, 2013
Due Date: December 8, 2013
Applicant Ad Date: May 28, 2013
Newspaper: *The Daily Mail*
UTM's: Easting: 471.75 km Northing: 4226.49 km Zone: 17
Description: Removal of a grandfathered engine and installation of a new engine and inclusion of tank emissions.

DESCRIPTION OF PROCESS

Natural gas enters the facility via pipeline. The natural gas is then compressed by four (4) compressors to a higher pressure. One of those compressors would be powered by the proposed 115 bhp two-stroke lean-burn Ajax DPC 120 natural gas fired engine.

After compression, the natural gas is sent through a triethylene glycol (TEG) dehydration unit to reduce the water vapor content of the natural gas stream. TEG flows down and countercurrent to the 12 MMscfd natural gas stream. Trays in the tower maximize the contact between the wet gas and the TEG increasing the water removal efficiency. The compressed dryer natural gas then exits the facility via pipeline.

The rich (wet) TEG leaves the bottom of the contacting tower and is routed through the BTEX Eliminator condenser prior to being routed to a flash tank and then to a 0.75 MMBTU/hr

reboiler 001-04B. The rich TEG is used as a coolant in the BTEX condenser. The rich TEG is then sent to a flash tank. The flash tank vapors are sent to the flash zone of the reboiler for a 95% control efficiency. The reboiler regenerates the rich TEG by boiling off the water and other constituents through the still vent 001-04A. The regenerated TEG or lean TEG is routed back to the contacting tower for reuse. The still vent emissions, which contain VOCs that were trapped in the TEG along with the water, are transferred to the BTEX Eliminator system that condenses the steam and trace TEG. The reboiler combusts pipeline quality natural gas to generate the required heat. Stripping gas, a portion of the dehydrated gas, is routed to the reboiler and introduced to the rich TEG to support drying of this TEG.

Condensate, with trace TEG is drained from the BTEX condenser to storage. The entrained BTEX vapors are separated from the condensate and injected into the reboiler burner when it is operating. When the reboiler burner shuts down, the BTEX vapors are sent to the reboiler exhaust stack where they are contacted with an igniter to achieve thermal degradation. This mode of operation persists until the reboiler is restarted. Emissions from the reboiler exhaust stack are comprised of the combustion products of the natural gas fuel and BTEX vapors extracted from the reboiler still vent.

SITE INSPECTION

A site inspection was conducted on February 4, 2009 by Fred Teel of the DAQ Enforcement Section. The facility was operating in compliance at that time.

Directions as given in the permit application are as follows:

Traveling southeast on US Route 60 from Glasgow, WV, travel approximately 7.2 miles towards Montgomery. The station gate is on US Route 60 on the left hand side of the road. The station is located approximately 0.2 miles from the gate.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

The emissions from the still vent and flash tank were estimated with GRI-GLYCalc. The emissions from the flash tank for this facility are shown to be negligible after being controlled by the flame zone of the reboiler.

The maximum controlled permitted point source emissions from CPC's Staten Run Compressor Station are summarized in the table below.

Emission Point ID	Process Unit	Pollutant	Maximum Controlled Emission Rate	
			Hourly (lb/hr)	Annual (ton/year)
001-05	AJAX DPC 120 115 bhp	Nitrogen Oxides	1.40	6.11
		Carbon Monoxide	0.44	1.89
		Volatile Organic Compounds	0.10	0.44
		Particulate Matter-10	0.04	0.18
		Formaldehyde	0.09	0.34
T03	Pipeline Fluids Tank	Volatile Organic Compounds	0.11	0.48
001-04A	0.75 MMBTU/hr TEG Dehydrator Reboiler	Nitrogen Oxides	0.08	0.33
		Carbon Monoxide	0.07	0.28
		Volatile Organic Compounds	0.01	0.02
		Sulfur Dioxide	0.01	0.01
		Particulate Matter-10	0.01	0.03
001-04B	12 MMscf/day TEG Dehydrator Still Column	Volatile Organic Compounds	0.29	1.26
		Benzene	0.03	0.11
		Ethylbenzene	0.01	0.01
		Toluene	0.02	0.08
		Xylenes	0.03	0.10
		n-Hexane	0.02	0.07

The following table indicates the control efficiencies that are achieved from controlling the Glycol Dehydration Unit Still Vent (RSV-1) with the BTEX Eliminator System (1C):

Control Device ID	Control Device	Emission Unit	Pollutant	Control Efficiency
1C	BTEX Eliminator System	0.75 mmBTU/hr TEG Dehydration Unit Reboiler Still Vent	Benzene	96 %
			Toluene	97 %
			Ethylbenzene	98 %
			Xylenes	99 %
			Hexanes	95 %

REGULATORY APPLICABILITY

Unless otherwise stated WVDEP DAQ did not determine whether the permittee is subject to an area source air toxics standard requiring Generally Achievable Control Technology (GACT) promulgated after January 1, 2007 pursuant to 40 CFR 63, including the area source air toxics provisions of 40 CFR 63, Subpart HH and 40 CFR 63, Subpart ZZZZ.

The following rules apply to the facility:

45CSR4 (To Prevent and Control the Discharge of Air Pollutants into the Open Air which Causes or Contributes to an Objectionable Odor or Odors)

45CSR4 states that an objectionable odor is an odor that is deemed objectionable when in the opinion of a duly authorized representative of the Air Pollution Control Commission (Division of Air Quality), based upon their investigations and complaints, such odor is objectionable. No odors have been deemed objectionable.

45CSR6 (To Prevent and Control Air Pollution from the Combustion of Refuse)

The purpose of this rule is to prevent and control air pollution from combustion of refuse.

This facility will have one (1) BTEX eliminator. The vapor combustor is subject to section 4, emission standards for incinerators. The facility will also monitor the flame of the BTEX eliminator and record any malfunctions that may cause no flame to be present during operation. The opacity limit for the BTEX eliminator is 20%.

45CSR10 (To Prevent and Control Air Pollution from the Emission of Sulfur Oxides)

45CSR10 Section 10.1 states that any fuel burning units having a design heat input under ten (10) million BTU's per hour will be exempt from section 3 and sections 6 through 8. However, failure to attain acceptable air quality in parts of some urban areas may require the mandatory control of these sources at a later date. Therefore, the 0.75 MMBTU/hr Glycol Dehydrator Reboiler would meet this criteria.

45CSR10 Section 4.1 states that no person shall cause, suffer, allow or permit the emission into the open air from any source operation an in-stack sulfur dioxide concentration exceeding 2,000 parts per million by volume from existing source operations. Therefore, the Glycol Dehydrator Reboiler is limited to a maximum of 2,000 ppm_v.

45CSR10 Section 5.1 states no person shall cause, suffer, allow or permit the combustion of any refinery process gas stream or any other process gas stream that contains hydrogen sulfide in a concentration greater than 50 grains per 100 cubic feet of gas except in the case of a person operating in compliance with an emission control and mitigation plan approved by the Director and U. S. EPA. In certain cases very small units may be considered exempt from this requirement if, in the opinion of the Director, compliance would be economically unreasonable and if the contribution of the unit to the surrounding air quality could be considered negligible. Compliance with the Federal Energy Regulatory Commission (FERC) limit for H₂S is 0.25 grains per 100 cubic feet. Pipeline quality natural gas has a low H₂S content, therefore if the incoming pipeline quality natural gas meets the FERC limit, this standard will be met.

45CSR13 (Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, and Procedures for Evaluation)

The permittee has voluntarily decided to update their permit to include a new engine.

45CSR22 (Air Quality Management Fee Program)

This facility is a minor source, not subject to 45CSR30, and the NSPS are Title V exempt. CPC is required to keep their Certificate to Operate current. CPC paid a \$1,000 construction application fee and \$2,500 NESHAP fee.

40CFR63 Subpart ZZZZ (National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combustion Engines)

Subpart ZZZZ establishes national emission limitations and operating limitations for HAPs emitted from stationary RICE located at major and area sources of HAP emissions. This subpart also establishes requirements to demonstrate initial and continuous compliance with the emission limitations and operating limitations. This facility's engine #4 is subject to the area source requirements for non-emergency spark ignition engines.

Engine #4 is an "Existing Stationary RICE" source at an area source of HAPs and is an affected source because construction will commence before June 12, 2006 [63.6590(a)(1)(iii)] due to the manufacturer's date (Engine DOM 1965) of the engine.

Engine #4 due to the manufacturer's date of the engine must comply with the applicable emission limitations, operating limitations, and other requirements no later than October 19, 2013. Engine #4 is a non-emergency, non-black start 2SLB stationary RICE (Table 2d.6). Engine #4 will have maintenance requirements for oil & oil filter, spark plugs, and hoses & belts.

40 CFR 63 Subpart HH (National Emission Standards for Hazardous Air Pollutants From Oil and Natural Gas Production Facilities)

On June 1, 2013 the DAQ took delegation of the area source provisions of 40 CFR 63, Subpart HH. Ball Station is a natural gas production facility that processes, upgrades, or stores natural gas prior to transmission. Ball Station is an area source of HAPs refer to the previous facility wide emissions table.

Pursuant to §63.760(b)(2), each glycol dehydration unit (GDU) located at an area source that meets the requirements under §63.760(a)(3) is defined as an affected facility under Subpart HH. The requirements for affected sources at area sources are given under §63.764(d). However, for a GDU, exemptions to these requirements are given under §63.764(e)(2) "actual average emissions of benzene from the glycol dehydration unit process vent to the atmosphere are less than 0.90 megagram [1 TPY] per year."

As shown above, the maximum PTE of benzene emissions from the GDU process vent is 0.13 TPY. Therefore, the GDU is exempt from the Subpart HH requirements given under §63.764(d).

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

There will be small amounts of various non-criteria regulated pollutants emitted from the combustion of natural gas. However, due to the concentrations emitted, detailed toxicological information is not included in this evaluation.

AIR QUALITY IMPACT ANALYSIS

The changes to this facility do not constitute a major modification under 45CSR14. Based on the nature of the emissions and the annual emission rate, no air quality analysis was performed. However, air dispersion modeling will be required if the Director finds existing circumstances and/or submitted data that provide cause for an assessment to be made concerning whether this facility may interfere with attainment or maintenance of an applicable ambient air quality standard or cause or contribute to a violation of an applicable air quality increment.

MONITORING OF OPERATIONS

CPC will be required to perform the following monitoring, recordkeeping, and reporting:

1. Monitor and record quantity of condensate produced by the BTEX Eliminator.
2. Monitor and report any malfunctions associated with the BTEX Eliminator.
3. Maintain records of the natural gas throughput to the glycol dehydration unit.
4. Maintain records of testing conducted in accordance with the permit. Said records shall be maintained on-site or in a readily accessible off-site location
5. Maintain a record of all potential to emit (PTE) HAP calculations for the entire facility. These records shall include the natural gas compressor engines and ancillary equipment.
6. The records shall be maintained on site or in a readily available off-site location maintained by CPC for a period of five (5) years.

RECOMMENDATION TO DIRECTOR

The information provided in the permit application indicates CPC's Staten Run Compressor Station meets all requirements of applicable regulations. Therefore, impact on the surrounding area should be minimized and it is recommended that the Kanawha County location should be granted a 45CSR13 modification permit for their facility.

David Keatley
Engineer

Date